

## Claims

- [c1] A stator bar for an electric machine, the stator bar having an outer insulation surrounding a perimeter thereof and extending along a longitudinal length thereof, the outer insulation comprising:
  - at least one extruded member containing an electrical insulation material and comprising an opposing pair of edges parallel to the longitudinal length of the stator bar, the edges being attached together so that the perimeter of the stator bar is entirely enclosed by the at least one extruded member.
- [c2] A stator bar according to claim 1, wherein the opposing pair of edges comprise interlocking features that physically secure the edges together.
- [c3] A stator bar according to claim 1, wherein the opposing pair of edges are welded together.
- [c4] A stator bar according to claim 1, wherein the at least one extruded member comprises a single extruded member that defines each of the opposing pair of edges that are attached together.

- [c5] A stator bar according to claim 4, wherein the single extruded member has a rectangular outer perimeter defining four corners and four sides therebetween.
- [c6] A stator bar according to claim 5, wherein the opposing pair of edges are located along one of the four corners of the outer perimeter of the single extruded member.
- [c7] A stator bar according to claim 5, wherein the opposing pair of edges are located on one of the sides of the outer perimeter of the single extruded member.
- [c8] A stator bar according to claim 1, wherein the at least one extruded member comprises two extruded members, each of the two extruded members defining a corresponding one of the opposing pair of edges that are attached together.
- [c9] A stator bar according to claim 8, wherein each of the two extruded members defines a corresponding one of a second opposing pair of edges that are attached together.
- [c10] A stator bar according to claim 8, wherein each of the two extruded members are C-shaped.
- [c11] A stator bar according to claim 1, further comprising: slots defined in each of the opposing pair of edges so

that each slot of a first of the opposing pair of edges opposes a corresponding one of the slots of a second of the opposing pair of edges; and  
a member located in each pair of the opposing slots to mechanically secure together the opposing pair of edges.

- [c12] A stator bar according to claim 1, wherein the electrical insulation material of the at least one extruded member is chosen from the group consisting of electrometric and filled thermoplastic materials.
- [c13] A stator bar for a generator used in power generation of alternating current delivered to a distribution network, the stator bar comprising:
  - a bare bar comprising strands of electrical conductors oriented parallel to each other and strand electrical insulation surrounding each of the strands of electrical conductors; and
  - an outer insulation surrounding a perimeter of the bare bar and extending along a longitudinal length of the bare bar, the outer insulation comprising at least one extruded member containing an electrical insulation material, the at least one extruded member comprising an opposing pair of edges parallel to the longitudinal length of the stator bar, the edges being welded together so that the perimeter of the bare bar is entirely enclosed by the at least one extruded member and the outer insula-

tion forms a substantially void-free barrier around the bare bar.

- [c14] A stator bar according to claim 13, wherein the opposing pair of edges comprise interlocking features that physically secure the edges together.
- [c15] A stator bar according to claim 14, wherein the interlocking features comprise a projection on one of the opposing pair of edges and a recess defined in a second of the opposing pair of edges.
- [c16] A stator bar according to claim 14, wherein the interlocking features comprise:
  - slots defined in each of the opposing pair of edges so that each slot of a first of the opposing pair of edges opposes a corresponding one of the slots of a second of the opposing pair of edges; and
  - a member located in each pair of the opposing slots to mechanically secure together the opposing pair of edges.
- [c17] A stator bar according to claim 13, wherein the at least one extruded member comprises a single extruded member that defines each of the opposing pair of edges, the single extruded member having a rectangular outer perimeter defining four corners and four sides therebetween, the opposing pair of edges being located along

either one of the four corners of the outer perimeter of the single extruded member or along one of the sides of the outer perimeter of the single extruded member.

- [c18] A stator bar according to claim 17, wherein the single extruded member comprises a layer of the electrical insulation material and further comprises an inner layer of a conductive material on an interior surface of the electrical insulation material and an outer layer of a conductive material on an exterior surface of the electrical insulation material.
- [c19] A stator bar according to claim 13, wherein the at least one extruded member comprises two extruded members, each of the two extruded members defining a corresponding one of the opposing pair of edges that are attached together and defining a corresponding one of a second opposing pair of edges that are attached together, each of the two extruded members being C-shaped.
- [c20] A stator bar according to claim 19, wherein each of the two extruded members comprises a layer of the electrical insulation material and further comprises an inner layer of a conductive material on an interior surface of the electrical insulation material and an outer layer of a conductive material on an exterior surface of the electrical insulation material and further comprises an inner layer of a conductive material on an interior surface of the electrical insulation material and an outer layer of a conductive material on an exterior surface of the electrical insulation material.

cal insulation material.

- [c21] A method of applying an outer insulation to a stator bar for an electric machine, the method comprising the steps of:
  - extruding the outer insulation to comprise at least one extruded member containing an electrical insulation material, the at least one extruded member having an inner cavity extending a longitudinal length thereof and an opposing pair of edges parallel to the longitudinal length thereof;
  - inserting the stator bar into the inner cavity of the outer insulation so that the outer insulation surrounds a perimeter of the stator bar and extends along a longitudinal length thereof; and then
  - attaching together the opposing pair of edges of the at least one extruded member so that the perimeter of the stator bar is entirely enclosed by the at least one extruded member.
- [c22] A method according to claim 21, wherein the at least one extruded member is extruded so that the opposing pair of edges comprise interlocking features that physically secure the edges together as a result of the attaching step.
- [c23] A method according to claim 21, wherein the attaching

step comprises welding the opposing pair of edges together.

- [c24] A method according to claim 21, wherein the at least one extruded member comprises a single extruded member that is extruded to define each of the opposing pair of edges.
- [c25] A method according to claim 24, wherein the single extruded member is extruded to have a rectangular outer perimeter defining four corners and four sides therebetween.
- [c26] A method according to claim 25, wherein the single extruded member is extruded so that the opposing pair of edges are located along one of the four corners of the outer perimeter of the single extruded member.
- [c27] A method according to claim 25, wherein the single extruded member is extruded so that the opposing pair of edges are located on one of the sides of the outer perimeter of the single extruded member.
- [c28] A method according to claim 21, wherein the at least one extruded member comprises two extruded members, each of the two extruded members being extruded to define a corresponding one of the opposing pair of edges.

- [c29] A method according to claim 28, wherein each of the two extruded members is extruded to define a corresponding one of a second opposing pair of edges.
- [c30] A method according to claim 28, wherein each of the two extruded members is extruded to be C-shaped.
- [c31] A method according to claim 21, wherein the at least one extruded member is extruded so that slots are defined in each of the opposing pair of edges so that each slot of a first of the opposing pair of edges opposes a corresponding one of the slots of a second of the opposing pair of edges, and the attaching step comprises inserting a member in each pair of the opposing slots to mechanically secure together the opposing pair of edges.
- [c32] A method according to claim 21, wherein the electrical insulation material of the at least one extruded member is chosen from the group consisting of electrometric and filled thermoplastic materials.
- [c33] A method of applying an outer insulation to a stator bar for a generator used in power generation of alternating current delivered to a distribution network, the method comprising the steps of:  
forming a bare bar comprising strands of electrical conductors oriented parallel to each other and strand elec-

trical insulation surrounding each of the strands of electrical conductors;  
extruding the outer insulation to comprise at least one extruded member containing an electrical insulation material, the at least one extruded member having an inner cavity extending a longitudinal length thereof and an opposing pair of edges parallel to the longitudinal length thereof;  
inserting the bare bar into the inner cavity of the outer insulation so that the outer insulation surrounds a perimeter of the bare bar and extends along a longitudinal length thereof; and then  
welding together the opposing pair of edges of the at least one extruded member so that the perimeter of the bare bar is entirely enclosed by the at least one extruded member and the outer electrical insulation forms a substantially void-free barrier around the bare bar.

- [c34] A method according to claim 33, wherein the at least one extruded member is extruded so that the opposing pair of edges comprise interlocking features that physically secure the edges together prior to the welding step.
- [c35] A method according to claim 34, wherein the interlocking features are formed as a projection on one of the opposing pair of edges and a recess defined in a second of the opposing pair of edges.

- [c36] A method according to claim 34, wherein the interlocking features are formed to comprise slots defined in each of the opposing pair of edges so that each slot of a first of the opposing pair of edges opposes a corresponding one of the slots of a second of the opposing pair of edges, the method further comprising the step of inserting a member in each pair of the opposing slots to mechanically secure together the opposing pair of edges prior to the welding step.
- [c37] A method according to claim 33, wherein the at least one extruded member is extruded to comprise a single extruded member that defines each of the opposing pair of edges, the single extruded member having a rectangular outer perimeter defining four corners and four sides therebetween, the opposing pair of edges being located along either one of the four corners of the outer perimeter of the single extruded member or along one of the sides of the outer perimeter of the single extruded member.
- [c38] A method according to claim 37, wherein the single extruded member comprises a layer of the electrical insulation material and further comprises an inner layer of a conductive material on an interior surface of the electrical insulation material and an outer layer of a conductive

material on an exterior surface of the electrical insulation material.

- [c39] A method according to claim 33, wherein the at least one extruded member is extruded to comprise two extruded members, each of the two extruded members defining a corresponding one of the opposing pair of edges that are attached together and defining a corresponding one of a second opposing pair of edges that are attached together, each of the two extruded members being C-shaped.
- [c40] A method according to claim 39, wherein each of the two extruded members comprises a layer of the electrical insulation material and further comprises an inner layer of a conductive material on an interior surface of the electrical insulation material and an outer layer of a conductive material on an exterior surface of the electrical insulation material.